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THE NESTING OF THE BLACK KITE (*MILVUS MIGRANS*) IN THE TERRITORY OF VERONA.

By Count Ettore Arrigoni degli Oddi,
Member of the Royal Venetian Institute of Sciences.

The Black Kite (*Milvus migrans*, Boddaert)[*] has, until now, been considered a bird rarely seen in any part of Italy, occurring in some places as a rare straggler, and almost unknown; in others as a breeding species, but without becoming permanently established.

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[*] Mr. Seebohm ('British Birds,' vol. i. p. 80), after having criticised Messrs. Newton and Dresser, who call this species by the name of *M. migrans*, Boddaert (1783), and Dr. Sharpe, who called it *M. korschun*, Gmelin (1771), adds that some future ornithologist, evincing more zeal than discretion, may adopt the name of *M. milano*, Gerini (1767), in homage to the law of priority. Mr. Seebohm has here fallen into a singular error; the bird drawn by Gerini on plate i. No. 38, of vol. i. of his remarkable work, 'La Storia degli Uccelli,' is not our *M. migrans*, but simply a variety of *Buteo vulgaris*, and the identical bird which Savi elevated to the rank of specific rank under the title of *Falco pojana*. Italian ornithologists all agree in referring Gerini's *milano* to *Buteo vulgaris*, and they place the same name under the synonyms of this species. Gerini speaks of *M. migrans* in the course of his work, but under the title of "Falco detto Nibbio nero." These are his words (*l. c.* p. 71):—"Falco detto Nibbio nero Falx = Falco Milvus niger Schwenk et Sibbald, &c. Asturis magnitudine, remigibus majoribus nigris, cauda supra fusca, collo et uropygio albicantibus; cera lutea, rostro nigro, pedibus gracilioribus luteis." He does not mention it as

The following are the principal opinions of our ornithologists as to the appearance of the Black Kite in Italy:—

ITALY GENERALLY.—Salvadori, T.[*]: This Kite is rare in Italy; still there is scarcely a province in which it has not been found, and it has even bred in several places. Savi, P.[†]: "It is very rare in almost every part of Italy," &c. He says that it lives constantly along the Riviera di Levante on the mountains. Giglioli[‡]: A rare species in Italy, but it has been found in small numbers everywhere in the central and southern regions, in which it has also bred, &c. Idem[§]: It is not a common species, but perhaps resident in Italy, in all parts of which a few individuals have been taken. Salvadori, T.[||]: A summer bird, but rare; it has nested in some localities. Martorelli, G.[¶]: "The Black Kite cannot be said to be common in any part of Italy, though it breeds in some localities. . . . It is much more easily found in our country in the fine than in the bad season, and it is therefore a summer bird, and one of passage." Continuing, the author says that Giglioli had five examples of the Black Kite, caught at one and the same time at Lanzo. I cannot tell how Martorelli could have made such a blunder, for the renowed Professor of Florence says:—"In the Central Italian collection I have eight specimens, caught at Lanzo (October), Nice (December), Genoa (July), Florence (autumn), Terracina (April, May); so that the eight specimens were taken in the five above-mentioned localities. This species is not cited as Italian in the 'Storia Naturale degli Uccelli.'

PIEMONTE.—It is omitted by Bonelli; considered rather rarer than *Milvus ictinus* by Camusso. Giglioli speaks of an adult male which he had from the neighbourhood of Turin, May 15th, 1886.

LOMBARDIA.—Monti states that the Black Kite is rare at Como; he notes a specimen from Lugano. Messrs. Prada, Mazza, and Pavesi record this species from the Province of

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an Italian species; he only adds, like Brisson, "Mures et Locustas in agris inquirit; Pullos tamen Avium adhuc volandi impotentes avidissime rapit."

[*] Faun. d'Italia, ii. Uccelli, p. 13 (1872).

[†] Orn. Toscana, vol. i. p. 38 (1827).

[‡] Elenco, p. 40 (1881).

[§] Avif. Ital. n. 245, p. 248 (1886).

[||] Elenco Ucc. Ital. p. 47 (1887).

[¶] Monogr. Ucc. Rap. d'Ital. p. 116 (1895).

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Pavia; Zanni and Bettoni record it for Brescia; Paglia records it for Mantovano; Ferragni for Cremona; Carlini does not record it for Valtellina; Pavesi excludes it from the region of Tessin, but Riva* had previously recorded a single specimen. Authors agree in saying that it is rare in these places, except Ferragni,† who says that in the Province of Cremona it is scarce, but passes regularly in May.

Venetian Territory.—Count Ninni‡ says:—"It lives in the wood of Cansiglio, but it is not certain that it nests there. It has nested in the wood of the Marquis of Canossa at Grezzan (Perini)." Naccari does not record the Black Kite from Venetian territory, and Contarini refers to it as a rare bird. Ninni had a nestling, but he calls it an accidental visitor, and very rare. A specimen from the Province of Treviso, caught at the mouth of the Sile, is preserved in Scarpa's collection. I have mentioned a specimen killed at Vigodarzere on May 25th, 1885. We do not find it mentioned among the birds of the Province of Belluno (Doglioni), nor among those of Friuli (Vallon, Pirona); but recently my friend Professor Tellini has included this species among those which are probably caught in the aforesaid region, but which cannot yet be declared as such for certain. It is not noticed among the birds of Bassano (Baseggio), nor among those of the Province of Rodigino (Dal Fiume). We have no precise information for the Province of Vicenza. As for Verona, Perini,§ an author who cannot always be relied upon, wrote, in 1858, that, during a period of fifteen years, he had only succeeded in observing two examples of the Black Kite. "We are assured, however," he adds, "by the Marquis Bonaventura, of Canossa, that this Kite breeds in his wood at Grezzan, where it lays from three to four eggs of a yellowish white colour, with obscure spots very close to one another." In his edition of 1874 the same author remarks: "It is rare in our Province; its nest has, however, been found sometimes," without naming a locality. De Betta says it is rare, and, relying simply on Perini, states that it has bred in Canossa's wood. I do not find the Black Kite mentioned in Garbini's works, but this author has applied himself only to water-animals (aquatic animals). Lastly, Dal Nero, in an article contributed to the 'Bollettino Agrario Veronese' of 1892, mentions the appearance of *A. migrans* in the Province of Verona; he says that it is rare and appears casually, that it is seen in very irregular numbers, and that it breeds at Grezzano. All these authors therefore agree in admitting the appearance and breeding of this Kite at Grezzano as an exceptional circumstance. Kolombatovich, Schiavuzzi, and Bonomi call the Black Kite a rare species in Dalmatia and in the Tyrol.

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* Orn. Ticinese, p. 63 (1865).

† In Giglioli, Avif. Ital. vol. i. p. 400 (1889).

‡ Cat. Ucc. del Veneto, in Comment. ecc. i. p. 9 (1868).

§ Uccelli Veronesi, p. 15 (1858).

EMILIA. — Bonizzi, Doderlein, Carruccio, and Picaglia say that the Black Kite is rare in this region.

MARCHE.—It is not mentioned either by Paolucci, Carpegna, or Gasparini. On the contrary, Professor Paolucci, of Ancona, a well-known and eminent ornithologist, has recently favoured me with the following information:—"I have never seen (in the Marche) *Milvus migrans*, which is, of course, unrepresented in our collections; nor have I ever heard of this species being caught in our district, though, from the obvious character of its forked tail, it might have been reported by sportsmen. So far as my information goes, it is quite unknown in the Marche (*in lit.* June 21st, 1897).

TUSCANY.—Dei does not mention the Black Kite in 1862, in treating of the Province of Siena; but at a later date* he had a specimen. It is noted by Griffoli for the Val di Chiana; by Savi for the Province of Pisa; by Professor Giglioli for the Florentine region; by the Marchese Paolucci for the Province of Siena; by Bianchi as a bird of passage in the Isola del Giglio.

LIGURIA.—Durazzo says that it breeds, but that it is rarer than *Milvus ictinus*. Savi and Carazzi say that it is rare at Spezia; a straggler at Nice. *Milvus migrans* is said to constantly inhabit the mountains of the Riviera di Levante, and Giglioli had one from Nice in December. I have spent many months in winter in the Riviera, but I do not remember ever having seen the Black Kite flying among the mountains, and I have little faith in its being a stationary species in that country.

ROMAGNA; ROMAN PROVINCES.—Prince Bonaparte states that the Black Kite breeds in the mountains, which does not seem very probable. Salvadori, Giglioli, and Martorelli had specimens from these regions. The Marquis Lepri writes to me as follows:—"This Kite is with us a summer visitor, and fairly abundant without being positively common. It appears between the end of March and the beginning of April. It continues to pass until the latter end of May. It is then easily met with, being less shy than *M. ictinus*. I have this year seen more than one about the country-side. Several specimens are brought every year to the shop of the taxidermist De Dominicis, generally birds that have been caught in the Royal Domain of Castel Porziano, situated on the coast between Ostia and Anzio. So far as I have been able to observe, the Black Kite frequents running water, especially streams bordered by large trees. In the case of a specimen which I procured a few days ago, the stomach was full of fish. As for the breeding of the Black Kite, at least as far as concerns our province, I do not think that it occurs on the mountains, as Bonaparte states. I have never seen it on the mountain, neither is it known there. *M. ictinus* is also very rare on these heights; it does not breed here, though so abundant on the plain. *M. ictinus* breeds on large trees in woods on the plain, or beside running water; I have observed its nest several times. Referring to the extensive information which I have gathered on the subject, I think that the same holds good of *M. migrans*, and this is confirmed by the fact that at the beginning of July last year I saw in the shop of a bird-dealer a *M. migrans* scarcely covered with feathers that had been taken from its nest on one of those gigantic elm trees that border the Tiber near Castel Giubileo, a few chilometres from Rome."

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* Giglioli, Avif. Ital. i. p. 401 (1889).

SOUTHERN ITALY.—It is rare, according to the eminent De Romita, in the Puglie. De Fiore excludes it from Catanzaro, and Moschella mentions it doubtfully in his Catalogue of the Birds of Reggio, Calabria. He writes to me, however, in a letter of June 3rd, 1897:—"I have frequently observed the Black Kite this year; about twenty specimens have been caught. I have only been able to procure one specimen for myself—a male—and certainly not cheap." I also secured two specimens caught in that district on the 7th and 18th of May, kindly sent to me by Dr. Angelo Pertile. Our ornithological information from this vast region is, unluckily, very incomplete.

Sicily.—Very rare, according to Benoit, who adds:— "I am told, however, that it often appears in the interior of the island." Doderlein says that it is very rare, confuting the assertion of Schembri, who mentions it as very common. Giglioli also says that it is rare; it is very rare in the Province of Messina (Ruggeri, Pistone); rare but resident upon the mountains in the district of Modica (Dellafonte, Garofalo); finally, Leonardi excludes the Black Kite from his list of the birds of Girgenti. At Malta it is rare, according to Schembri, Wright, and Blasius.

Sardinia.—Cara notices the Black Kite as being less common than *Milvus ictinus*. It has been mentioned by Salvadori and Lepori on the strength of this assertion; Giglioli found a young specimen in the Cagliari Museum, labelled *Falco barbarus*.

It is evident from the facts just stated that the Black Kite is seen almost all over Italy, but nowhere with any degree of certainty; that it has been found breeding in some places, but always as a rare and isolated circumstance, except perhaps in the Roman Campagna Romagna, where it appears to occur with a certain regularity. In the present paper I shall make known a locality where the important phenomenon occurs of a real and constant breeding station of the Black Kite, which is resorted to every year by a number of pairs—quite a novel event in the history of our avifauna. This happens on an estate belonging to the noble and historical family of the Marquis of Canossa, *i.e.* in the wood of Grezzano, near Villafranca, in the Province of Verona. Vittorio dal Nero, a modest but conscientious and diligent observer, was the first to speak to me of this fact; and it is indeed strange that this has until now been unknown to the ornithologists of Italy—and particularly to those of Verona, Perini and De Betta—who have mentioned the breeding of the Black Kite at Grezzano as quite a casual fact. Here I desire to acknowledge my indebtedness to the Marquis of Canossa, of Verona, for his kindness in allowing me to go to Grezzano, for sending me some specimens, and for supplying me with information; I must likewise return thanks to the Rev. Don Pietro Carcereri. He is very fond of sport, and an intelligent observer and has diligently studied the habits and life-history of the Black Kite; he has sent me several notes, which I have found most useful. Grezzano wood is about an hour and a half's drive from

Verona, beyond Villafranca. It is very near the magnificent Villa Canossa, from which it is separated by an iron gate; it is surrounded by a wide ditch, and marshes on one side, with a field partly laid out as a garden; on the other two with the country, which is covered with rice fields, meadows, and corn fields. The ground is intersected by numerous narrow channels. The wood is composed of plane trees, elms, oaks, poplars, chestnuts, &c., the greatest height of which may be about forty metres; it has a flourishing appearance, and the vegetation is splendid, but there are no firs. *Ardea cinerea* and *A. purpurea*, *Corvus cornix*, *Nycticorax ardeola*, *Ardeola ralloides*, and *Corvus corax* breed here; there are also quantities of Turtle-Doves, Golden Orioles, Blackbirds, Woodpeckers, and other smaller birds. In winter *Buteo vulgaris* is also found here, but, according to the inhabitants of the Castle, disappears as soon as *Milvus migrans* arrives.

In the Province of Verona, *Milvus migrans* is only to be found at Grezzano, "perhaps," says the Rev. Carcereri, "because it is attracted by the high trees; perhaps, because in that region and the neighbourhood it procures the food which it prefers, which consists of young chickens, when it can find them. Only two specimens are believed to have been killed at Chiesanuova, a mountainous spot to the north of Verona. One of these has been cited by Dal Nero. With these exceptions none have been seen except at Grezzano. It is simply a summer bird, since it arrives in spring, and leaves at the end of summer after having bred.

The following dates represent our information as to the arrival and departure of the Black Kite at and from Grezzano:—

Year.	Arrival.	Departure.
1883	March 18th—May 12th	July 25th—August 18th.
1884	April 5th—May 10th	August 1st—September 3rd.
1885	March 28th—May 6th	July 18th—August 29th.
1886	March 16th—April 24th	August 2nd—August 30th.
1887	March 12th—May 5th	August 5th—August 28th.
1888	March 16th—May 1st	July 28th—September 1st.
1889	March 10th—May 8th	August 6th—August 29th.
1890	March 18th—May 5th	August 3rd—September 2nd.
1891	March 20th—May 9th	August 4th—August 29th.
1892	March 11th—May 2nd	August 5th—August 19th.
1893	March 16th—May 1st	August 1st—September 2nd.
1894	March 10th—May 6th	August 4th—August 31st.
1895	March 12th—May 8th	August 9th—September 1st.
1896	March 15th—May 5th	August 6th—September 9th.
1897	March 18th—May 11th	July 20th—August 12th.

The birds, however, that arrive in March may be considered as the vanguard, and they come singly, while the main body arrive in April. The arrivals and departures are said to coincide with those of the Martin; the dates of which, for the Province of Verona, would run from April 12th to May 1st, and from July 25th to September 10th. Some Martins are, however, found also in October, while Black Kites have never been observed at Grezzano at that epoch. They arrive separately, and not in flocks, a fact which has already been stated by Ferragni in treating of the Province of Cremona, and by Ruggeri and Pistone in writing of that of Messina. Irby in Spain, Favier in Morocco, and Count Allèon at Constantinople have observed that Black Kites migrate in numerous troops. As soon as they arrive, they set about constructing their nests, which they build new every year. They have never been known to take possession of those of Herons or Crows, which are so abundant in those regions, and with these birds they seem to live in peace. Their nest is ready about the 10th of May, and they take twenty days to build it. They generally breed only in the wood; but nests have also been found in old and lofty trees in the country round about. They prefer the poplar, and build more rarely in the oak. They choose tall trees that reach a height of from thirty to forty metres, and build their nests on the fork of the thickest branches, perhaps for safety, so that the wind may not blow them down from such a height. They are large and easily noticed from the ground, and the bird hatches without being seen; but sometimes the nests are smaller, and then the head and tail of the sitting bird peep out. But this only occurs when they are young; in the second year of their age they make it larger. Goebel also says that the nest is very small, and that very often the head and tail of the sitting bird can be seen on every side of the nest. The height of the nest from the ground varies from about twenty-five to thirty metres; it is seldom lower. It consists of stout twigs strongly interlaced, ill-connected, but intertwined, and secured to the branch, from which the nest stands out like a bundle of wood. In the interior you see a hard layer formed with pieces of paper, linen rags which the Kite gathers here and there about the houses and dunghills; mud, and the dry dung of oxen, horses, &c., are added to unite the rags strongly together. This nest-bottom resists the penetration of a fowling-piece. The Rev. Carcereri, desiring to kill some nestling Black Kites, was compelled to employ the Weterli carabine with a bullet to pierce the hardened layer. The nest is generally shallow, and sometimes lined with dead moss. Mr. Seebohm * observes that the fact of rags being found in the nest of the Black Kite has been declared to be an error; but he adds that the circumstance has been verified by Salvin in the Eastern Atlas. "He also states," adds Seebohm, "that its nest is usually built amongst the roots of a tree growing out of the rocks." In Italy, it has only been observed on lofty trees. When the nest is built, the female Black Kite lays her eggs, usually three, but sometimes even four in number, in the space of four or five days. Seebohm says that in Pomerania the eggs are usually two in number, and so does Irby of Spain; while Goebel, referring to the South of Russia, says that the eggs are three in number, though he adds they may accidentally be two, or even four in number; once only he observed five in a clutch. The eggs of the Black Kite are about the size of a medium hen's egg, usually but not invariably of a dirty white, with larger or smaller spots or brown spots of various tints. I here supply some information about four eggs of the Black Kite which form part of my collection.

Egg found on May 25th, 1891, at Grezzano.—This specimen is almost entirely of a dirty white, with a few spots of light brown, most numerous at the larger end; the smaller end is colourless. Another egg found on the same day.—It is almost entirely of a dirty white, with fine brownish spots widely dispersed as if sprinkled over all the surface, and so delicate that the egg, viewed at a little distance, appears to be colourless.

Egg found in June, 1892, at the same place.—This specimen is pure white, with large dots of a lively brown tint, darker round the edge of the dots, which are most numerous at the larger end; there are also many little spots of the same colour spread here and there. This egg approaches the one figured by Seebohm on plate v., fig. 1, of his above-mentioned work.

Egg found in June, 1893, at the same place.—The ground tint is of a less pure white, spread with little brown spots of dull brown, and there are some larger spots of the same colour,

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* 'British Birds,' vol. i. p. 83 (1883).

forming a kind of zone in the middle part of the same egg. It bears some resemblance to the egg figured as No. 2 on the plate v. of Seebohm's work, but would resemble still more that of the Common Bunting, and appears to be a rare variety. Colonel Irby mentions the great variety of colour noticed in the eggs of the Black Kite, and Seebohm has described several of them.

The following are the dimensions of the eggs which I have preserved:—

Egg of May, 1891.	Length, 5·68 cm.;	breadth, 4·30 cm.
Egg of June, 1892.	Length, 5·54 cm.;	breadth, 4·15 cm.
Egg of June, 1893.	Length, 5·18 cm.;	breadth, 3·79 cm.

The females only incubate, and that for a period of from eighteen to twenty days. The male does not share the duty of incubation, but flies continually round his mate at a very great pace, and, unless disturbed, he continues to wheel gently around the eyrie. If he is aware of anyone's presence, he rises high in the air, flying round in wide circles, as though desirous of touching the tops of the highest trees, but always keeps out of shot, and, if shot at, he rises still higher; if he is left alone, he slowly descends again. The inhabitants of the castle say that if they gently strike the tree in which a female Black Kite is sitting, the bird at once flies away. I could never observe this fact, and the birds which I killed were males.

It is difficult to reach the nest, which is always situated at a great height, involving a perilous climb. The Black Kite exhibits great affection for its young, which are fed by both the male and female parents. Young chickens are their favourite food, being plentiful in the country. Like other birds of prey (*Circus æruginosus*, *C. cyaneus*, *Buteo vulgaris*, &c.), the Black Kite feeds its young at more or less regular hours; that is, according to what the Rev. Carcereri says, in the morning from about 9 to 11 a.m., and in the evening one or two hours before sunset. I have commonly observed this fact with *C. æruginosus*, which also feeds its young ones with chickens, and which breeds regularly in the marshes of Monselice. Its hours for feeding were about eight in the morning, and three in the afternoon. This may be explained by the fact that it cannot always get hold of chickens without being exposed to danger, and it must generally lie in wait for them in the open country, and far from human habitations. The housewife usually lets out the young chickens at hours most convenient to her; that is, either when she returns from market or after dinner; at her leisure time, that is, when it is most suitable for her to look after them, and keep them out of danger.

The Black Kite is decidedly a pest to chickens. It pursues them everywhere, even in the midst of people, and when it is sure of its aim, it pounces among them with a flight swift as lightning, snatches one, and carries it to its nest. *M. migrans* does not confine its chase for chickens to Grezzano, but it haunts the country round about, sometimes even at the distance of from seven to ten kilometres, to find its favourite prey, and then it goes back to its wood. The poor little chickens are often heard crying from the Kite's nest in which they are about to be devoured. This Kite also victimises the nestlings of other birds. It has on several occasions been seen to hover above Canossa's Palace where Starlings breed, and then to pounce upon the young birds which were hopping about the tiles. Besides this, remains of the following fishes have been found in the stomachs of Black Kites:—*Esox lucius*, *Tinca vulgaris*, *Scardinus erythrophthalmus*, *Cottus gobio*, and *Gobio fluviatilis*. A Black Kite, killed on June 15th, 1894, by the Rev. Carcereri, contained the bones of *Rana esculenta*. That gentleman tells me also that a Kite caught in May, 1893, and stuffed by Dal Nero, contained the remains of numerous aquatic insects. In two birds which I killed on the 3rd of June last year I found entire remains of *Rana esculenta* and *Grillotalpa vulgaris*.

The following is a list of substances found in the stomachs of about twenty Black Kites. These results have been procured by Dal Nero, the Rev. Carcereri, and myself, and they show how varied the diet of this greedy bird really is. I return thanks to Prof. Adriano Garbini, of Verona, for his kind assistance in classifying the worms and insects:—

VERMES (A) Nematoda.—Gen. *Lumbricus* (the species could not be identified).

ARTHROPODA (A) Crustacea.—*Cypris pubera*, O. F. Müller; *Cyclops* sp.?; *Asellus vulgaris*, Latr.; *Palæmonetes varians*, Leach. (B) Insecta.—*Smynthurus aquaticus*, Bourlet; *Libellula depressa*, L.; *L. rubiconda*, L.; *Phryganea reticulata*, L.; *Hydroporus marginatus*, Dft.; *Hydrophilus piceus*, L.; *Stratiomis chamæleon*, Deg.; *Grillotalpa vulgaris*, Latr.; gen. *Acridium; Cicada plebeja*, Scop.

MOLLUSCA.—*Limnæus ampullaceus*, L.

PISCES.—*Cottus gobio*, L.; *Esox lucius*, L.; *Gobio fluviatilis*, Cuv.; *Leuciscus erythrophthalmus*, Linn.; *Tinca vulgaris*, Cuv.

AMPHIBIA.—*Rana esculenta*, Linn.; *Bufo vulgaris*, Laur.; *Triton cristatus*, Laur.

REPTILIA.—*Lacerta viridis*, Daudin; *Tropidonotus natrix*, Linn.; *T. tessellatus*, Linn.

AVES.—*Sturnus vulgaris*, Linn.; *Gallus gallinorum* (chiefly small chickens).

MAMMALIA.—Gen. *Talpa; Crossopus fodiens*, Pallas; gen. *Mus;* gen. *Arvicola.*

The Black Kite is almost always in pursuit of prey during the day, but is most frequently seen flying about the wood at mid-day and towards evening. It soars so high that it is sometimes scarcely visible, but seems to be a Swallow, and continues wheeling about in circles, or resting suspended upon the expanded wings for some minutes; or, as Allèon says, describing great spiral lines, making various evolutions, rising and descending. Now and then, suddenly closing its wings, it drops down with an extraordinary swiftness and almost touches the highest tops of the trees, and then it recommences its slow spiral flight; if it is left alone, it comes down about the wood, flying among the lofty trees, probably in search of insects. I have several times seen them fly close to the surface of rice fields when over-flooded, and to running water, intent, as Bailly says, on fishing. That author has seen them plunge into the water and take small fishes. I have also noticed them flying over fields where they find *Acridium* and *Grillotalpa*, as has also been observed in Spain by Werner.

The number of Black Kites that every year arrive at Grezzano, breeding in companies in the wood, varies from forty to fifty birds. I think that the number given me by the inhabitants of that country must be exaggerated when they say that it amounts to two hundred birds. In 1892 the Rev. Carcereri shot as many as twenty-five Black Kites; but in the following years, 1893–96, only three or four fell to his gun. From what I have been able to observe, it is not easy to kill successive individuals, for the birds are very wary, and after the first few shots they soar very high; but, if the gunner hide himself carefully, the Kites fly down again, and can be killed with a good gun, especially when they enter or leave their nests. On the 3rd of June last year, without using all those precautions that the occasion would require, I was able in the space of a few hours to shoot down three fine Kites. They can be caught more easily when they have young ones. This species is commonly called *Poja negra* or *P. mora* by the inhabitants of Grezzano, and those who kill any Black Kites are blessed by the country people, for they see that the risk of their chickens being carried off is thus reduced. The following is a list of those collections that include Black Kites killed at Grezzano:—

(*a*) Collection Perini, of Verona, two specimens.
(*b*) Count Brasavola, of Verona, two specimens.
(*c*) Count Reali, of Treviso, two specimens.
(*d*) Collection Cipolla, of Verona, three specimens.
(*e*) Collection De Betta, of Verona, one specimen.
(*f*) Collection Bennati, of Verona, two specimens.
(*g*) My own collection, eight specimens.

Besides these twenty specimens, the Rev. Carcereri had several birds, which he killed himself, stuffed by Dal Nero, which he then gave to his friends.

The Black Kite is a species which varies very little in its dress. When young, the colours are darker and brighter than when at full maturity. The Rev. Carcereri informs me that almost all those he killed resembled one another. As for size, the female is always larger than the male.

ORNITHOLOGICAL NOTES FROM MALTA.

By Sergeant Hugh Mackay
(Highland Light Infantry).

During my stay in Malta I visited Mr. Micallef's interesting establishment at Birchircara, with a view of obtaining information regarding the numerous migratory birds which at times pass over the island. In a large show case of beautifully mounted specimens, I was prepared to find a number of birds which, although not altogether unknown in the British Islands, are nevertheless rare, and even here in Malta may be considered scarce, being only obtainable on migration. Altogether I saw no birds entirely foreign to the British Islands, yet for the benefit of the ornithological student the undermentioned species are well worth attention, if only for comparison with the numerous works on this interesting subject. I have not specified the scientific names of these birds, for the sake of space, while they are perhaps better generally known under their commoner names.

Ducks.—Garganey, Teal, Pochard, Pintail, Tufted, Scaup, Shoveller. These birds are obtained here during the winter months.

Herons.—Common, Purple, Squacco, and Night Herons; fairly common on migration.

Grebes.—Little Grebe, Sclavonian, and Black-necked. Of the three mentioned the Sclavonian is the most common, several specimens annually frequenting the Sliema and Quarantine harbours and other suitable localities between the months of October and January.

Owls.—Barn Owl, Long-eared, Short-eared, and Scops. All obtainable on migration; while the Short-eared species is known to breed sparingly on the island, and is therefore classed as a resident species.

I have enumerated under different headings the species which predominate; but as the remainder are isolated more or less from their families, it would occupy too much space to individualise each species under separate headings, therefore I will only comment upon those deserving note at the conclusion of the following list.

Grey Plover, Golden Plover, Turnstone, Starling, Glossy Ibis, Common Cuckoo, Bee-eater, Golden Oriole, Kingfisher, Black Redstart, Common Redstart, Pratincole, Great Grey Shrike (*Lanius excubitor:* I mention the scientific name of this bird to distinguish it from others of the same family), Common Bittern, Crane, Storm Petrel, Nightjar, Razorbill, Blue-headed Wagtail, Grey Wagtail, Turtle Dove, and Quail. All these birds have been obtained by Mr. Micallef, principally during the spring and autumn migrations. He pointed out to me several immature specimens of the Razorbill; adding that in one winter he secured thirty-four of these birds, all being young birds of the year.

At home I have had occasion to note and comment upon the irregular visits of the Razorbill, particularly along the shores of the Solway, where in some winters immature birds are extremely abundant, adult specimens being rarely found among them; while other winters pass without the appearance of a single specimen.

Three specimens of the Quail were also shown to me, one being plentifully suffused with bright yellow, the remaining two being of a dark reddish-brown colour, similar to that of the Red Grouse. In Malta, where Quails are so abundant on migration, it is not surprising to find some slight variation in size or colouring of plumage occurring.

Mr. Micallef has in his possession two specimens of the Nightjar, which at once attract the attention of an ornithologist. This is the species known as the Red-necked Nightjar, a species distinct from the common or Egyptian forms, and very rare.

The Whooper Swan is unquestionably of rare occurrence in Malta, being essentially an inhabitant of the far north; yet four specimens were shot on the Marsa during the month of March, 1898.

The Common Starling is known to almost everyone; but Mr. Micallef pointed out a specimen totally devoid of those markings so conspicuous on the British bird. This is the variety known as *Sturnus unicolor*, and only wanders to the Mediterranean in very cold seasons.

The Bittern and Golden Oriole pass the island on migration, the last named being a very rare wanderer to the British Islands; while it breeds in Greece, Sicily, the Balearic Islands, Spain, and France.

SCLAVONIAN and EARED GREBES.—Both species frequent the different harbours around Malta between the months of October and January.

KESTREL.—These birds are common in the winter months, but the majority leave the island in the spring months for their breeding grounds, probably Spain, where they are abundant.

REDBREAST.—During my stay in Malta (two years and a half) I saw only three of this species.

WAGTAILS.—White and Grey Wagtails common during the winter months.

FINCHES.—The Goldfinch, Greenfinch, Chaffinch, and Hawfinch. The first three named species are common on migration; the Hawfinch is much scarcer, and is obtained generally in the autumn. The whole of these birds are much prized by the Maltese as cage pets.

SISKIN.—I have only seen two Siskins personally in the open, and these were obtained by a birdcatcher; but I am informed they visit the island from time to time in large numbers.

LINNET.—I have observed several Linnets in the vicinity of Citta Vecchia, but, as yet, nowhere else upon the island, except at Manoel, where four were caught in a field near the camp.

NIGHTJAR.—Upon two occasions only have I seen and handled a pair of Nightjars, although the bird is said to be plentiful on migration. I examined one at Manoel on November 7th, 1896. Its appearance is unusual on the island at this period of the year.

SKYLARK.—The Skylark is somewhat plentiful on the island.

QUAIL.—Quails are extremely abundant all over the island during the migratory seasons, but particularly in April and May. One single specimen was shot on the shore at Manoel, November 7th, 1896; while as late as December 8th, 1896, six specimens were shot near the same place.

GOLDEN ORIOLE.—Saw several specimens near Pembroke camp between May 10th and 31st, 1896.

Stonechat.—Fairly common all over the island.

Purple Heron.—Observed a specimen of the Purple Heron on the ranges at Pembroke, April 16th, 1896; and subsequently handled the same bird in the flesh an hour later. I am informed it is of frequent occurrence on the island, principally during the winter months.

Jackdaw.—So far as my observations have gone this is the only representative of the Crow family existing on the island, and it appears to be confined to the localities of Citta Vecchia and Musta.

Montagu's Harrier. — Have seen a good many specimens at Pembroke camp during the months of April and May. They are common on migration.

Black Redstart.—Observed a single specimen on April 30th, 1897; and handled a bird in the flesh the following day which was shot near the shore at Manoel.

Thrush.—Observed a Thrush in the moat at Port Reale, November 1st, 1897. This is the first I have seen in Malta.

Bee-eater.—On April 18th, 1898, Capt. Murray shot a male specimen of the Bee-eater, which he kindly gave me. It is not uncommon during the migratory season.

Little Grebe.—Handled one of these birds which was shot near the shore at Manoel, April 20th, 1898.

Turtle Dove.—Abundant during April and May.

Hoopoe.—Saw a specimen of the Hoopoe in the moat at Fort Manoel. I was within twenty yards of it, and had an excellent view of the bird. I am informed that it is not uncommon on the island, although it is the only specimen I have seen. (September 6th, 1897.)

Blackbird.—There is only one place to my knowledge which these birds frequent in Malta, and that is at Musta, where they nest on the bushes which grow out of the rocky sides of a deep ravine.

Kingfisher.—I have only seen one solitary specimen of the Kingfisher here, and that in the early morning, near the Quarantine Bridge at Manoel, November 10th, 1897.

Shag or Green Cormorant.—Handled one of these birds which was shot on the shore at Manoel, November 12th, 1897.

Wild Geese.—A flock of Geese flew over Camp Manoel on November 19th, in a south-easterly direction, about 4.30 p.m.

Ruddy Shelduck.—A male example of the Ruddy Shelduck was shot in Sliema harbour, December 10th, 1897. I consider the occurrence of this species most unusual, and can only account for its appearance as a straggler. I am very sorry I did not secure the specimen.

Whitethroat.—These little birds are plentiful during the spring months. I have frequently found their nests around Manoel.

Lapwing. — On December 13th, 1897, I saw six Lapwings which had been shot in a field close to the Quarantine harbour. I am told they are of uncommon occurrence on the island.

Common Sandpiper.—Have seen several flocks in various localities in the months of April and May, but at no other time during the year.

Redshank.—Handled a fine specimen in full breeding plumage, April 16th, 1897. It was shot on the shore near Manoel; another bird was fired at, but got away. This is the first specimen I have seen in Malta.

Great Snipe.—A gunner along the shore at Manoel showed me four specimens of the Great Snipe which he had shot. These are the first I have seen.

Squacco Heron.—During the four days (April 29th to May 2nd) four specimens of the Squacco Heron frequented the shore at Manoel. They appear to be very lazy and inactive, allowing one to approach within twenty or thirty yards before taking wing. On the morning of May 1st I watched them for over half an hour, and during that time they remained almost motionless, except for an occasional turn of the head; the head and neck were drawn back upon the shoulders. I subsequently handled two of these birds in the flesh, which were shot by a native.

Short-toed Lark.—This is a resident species in Malta, and is fairly common. I found a nest with young as late as July 11th, 1897.

NOTES ON SOME BIRDS FROM NORTH WORCESTERSHIRE.

By H. E. Howard.

The following notes were made between the hours of 2.30 and 6, in the morning of May 14th, in those extensive woods which once formed part of the Forest of Feckenham. A short account of these woods would perhaps be useful. They are very undulating, the highest point being about 400 ft. The trees are chiefly oaks, and in places where a year or two before the older ones have been cut down the ground is covered with low bushes of hazel and birch, with plants of various kinds; and here Warblers abound.

It was quite dark when I started on this morning. The first bird to begin singing was a Lark; this was about twenty minutes to three. They nearly always are the first to start, and, even though quite dark, they are high up in the air. A Redstart was next, followed closely by a Cuckoo.

It took me about twenty minutes to reach the wood, and by that time it was beginning to get light. The noise of the different birds singing was almost deafening; there seemed to be a Blackbird, Thrush, or Nightingale in every bush. Going some distance on, I sat down and listened. At first I heard nothing more than Thrushes, Blackbirds, and Nightingales, except a Nightjar, which was some distance in the woods, and a Fox which passed about fifty yards away, filling the wood with his unearthly howling. Now and then a Whitethroat would begin its song, but stop as if it was not quite awake. By 4 o'clock every bird was uttering a note of some sort or other.

Going farther in among the nut-bushes, I found Garden Warblers plentiful, and Blackcaps, of course, for a more jealous couple it would be impossible to find. The Blackcap is generally the aggressor; he flies at the Garden Warbler, and then starts to sing, his tail spread out and his wings drooping; and now is the time when they sing most beautifully, more so even than when the females arrive. At times they positively seem to *curse* one another, the Blackcap always being the more excitable of the two. A Wood-Warbler was singing among the oaks. You nearly always find them in oaks or birches, and generally on the side of a hill. I always look on the Wood-Warbler as one of the most beautiful birds we have, both in colour and form.

Coming out into a little lane, which passed through the middle of these woods, I saw a pair of Lesser Whitethroats mating. The male Warblers are always worth watching when the females arrive; they have such curious ways of flirting. The Wood-Warbler seems to select two trees, and flies backwards and forwards between them, singing as he gets to each one. The Chiffchaff wanders about in the air like a big moth, flapping his wings very slowly. The Blackcap makes vain attempts to touch the top of his head with his tail. But most curious of all is the Grasshopper-Warbler; for some reason he runs about on the ground with a leaf in his bill—what the object of it was I could never quite tell—the female running about like a mouse, hardly ever uttering a note, though I have heard it once, very much like the young birds when fully fledged. Whitethroats abound in this lane, some in bright plumage, and others so dull you would hardly know them to be the same bird. They arrive in this state; two birds arrive at the same time, one in beautiful plumage, the other quite dull. Why this is I do not know, never having followed them to their winter quarters. The plumage of all Warblers very soon becomes dull, especially that of Whitethroats; I have shot a Wood-Warbler at the end of June in the most lovely plumage, and, when skinned, found it was covered with fat. The same with Yellow Wagtails, and these could only have lately arrived, for their brilliant yellow lasts but a week or two after they come to this country.

Turning into the wood again, among the oaks, I saw a pair of Greater Spotted Woodpeckers playing about, chasing one another from tree to tree; interesting birds to watch, especially when they have young. I have sometimes heard them rattling on a tree nearly a mile away; this particular pair evidently had a nest close by. Farther on in the woods a Green Woodpecker was laughing away to himself. The Greater Spotted is the most common of all the three Woodpeckers we get here. No Pheasants are reared in these woods, so Jays and Magpies are allowed to flourish. The Jay is the worst mimic there is, though at times he warbles to himself very quietly.

Coming to the outskirts of the wood, I saw a Cirl Bunting singing in a little orchard close by. These birds have increased very much the last few years, and breed annually in one or two spots. On the top of an elm a Wryneck was sitting, all huddled up except when he threw his head back and stretched out his neck to utter his curious note. Farther on in the meadows you could hear the Redpolls calling. At this time of year they are very fond of osier-beds to roost in, especially those where a few years ago the trees have been cut down.

The woods are full of Stock-Doves, Turtle-Doves, and Ring-Doves. In a hedge a Grasshopper Warbler was singing; they are fairly common in this part of the county, but do not often sing here after the middle of May till the end of June—that is, during incubation. This one was sitting on the top of a thick bush, like a round ball of feathers. I got close to him, but he saw me, and at once every feather was drawn tight to his body, and he became an ordinary bird as the world knows him; then, climbing down, he hid among the bushes. Waiting for about ten minutes, he presently appeared climbing up the middle of the bush again till he got to the top; there he sat sunning himself, his feathers swollen out, and his form perfect, as beautiful a creature as you could see.

To see them in all their beauty birds must be unconscious of your presence; there is a vast difference between a bird as he is usually seen with his feathers lying flat on his body, and a bird that is really at rest, unconscious of the presence of any human being; then it is the feathers rise and fall in beautiful order, and form the most perfect outline. At the end of five years, if you live amongst them, you will begin to see their beauty; at the end of another five you will have learnt how little you knew at the end of the first five. There are some who seem to think there is no more to be learned about British birds as regards their form and habits. This can never be—the subject is endless.

NEW BRITISH ANNELIDS.

By Rev. Hilderic Friend.

The following records serve to show that as yet we are far from having gained a complete knowledge of the Annelid fauna of our own country. Nearly every time I go out to collect, some species new to Britain or to science is discovered; and, as each species has its place in the economy of nature, it is clear that we have much yet to learn respecting the part which the lesser worms play as friends or foes of the farmer and the gardener. My present records will be limited to one family, the Enchytræids. For the rest, suffice it to place on record the fact that *Limnodrilus hoffmeisteri*, Claperède, was found by me at Easter near the lake in Sutton Park, Birmingham—this being, so far as I know, the first record for this country.

1. Fridericia magna, n. s.

During Easter week, while on a visit to the Lake District, I went one day to the meeting of the waters where the Cocker joins the Derwent under the shadow of the Castle, and in view of Wordsworth House at Cockermouth. Among my other gleanings I here took two specimens of a worm which I at once found to be new to me, and, as it proved, new to science also. Its large size at first threw me off the track, and it was some time before I could bring myself to believe that it was a veritable Enchytræid, and a *Fridericia*, despite its well-marked characteristics. It was the largest species of the genus I have ever found, as it somewhat exceeded in size the seaside worm known as *Enchytræus humicultor*, which I once found on the banks of the Solway.

Fridericia magna *is 35–40 mm. in length, and consists of about ninety segments. There are two setæ in each bundle behind the girdle, and three usually in each bundle on all the preclitellian* *segments. I found as many as four setæ in two of the bundles, and, according to the accepted theory respecting this genus, the setæ should always be in even numbers* (2, 4, 6, 8) *; but the rule is by no means invariable. In one specimen the four posterior segments were without setæ, and the penultimate set of four had only one seta in each sac. A marked peculiarity of this species is to be found in the colour of the blood, which is decidedly disposed to be red, as may be seen when the worm has been kept for a day or two in clean water. The body segments are striate, with about half a dozen rows of striate cells per segment. The girdle extends over segment* xii *and the hinder half of segment* xi, *the usual gland-pores being found on the former segment. I traced the dorsal blood-vessel to segment* xviii, *so it is post-clitellian in origin. The egg-sac extended back to the sixteenth segment. The blood-vessels in segments* i–iv *did not differ greatly in arrangements from that which usually prevails, the dorsal vessel giving off two branches on each side in the third segment, which formed loops and joined the returning vessels caused by the dorsal vessel dividing into two at the head. I found heart-like swellings in segments* vii, viii, ix. *The brain is nearly as broad as long, convex behind, and very slightly concave in front, the outline being slightly oval rather than circular. The coiled tube of segment* xi *is very long and fine; but the most obvious characteristic is found in the spermathecæ. There is a pair of sacs at the base of the pouch which is attached to the intestine, and at the outer extremity, between segments* iv *and* v, *the aperture of the spermathecal tube has a pair of large brown glands. These are so conspicuous that when first seen they have all the appearance of eye-spots. The length of the tube is about three times the width of the sacs.*

I have named the species *magna*, because it is by far the largest yet described. I have not studied the nephridia, nor have I as yet determined the salivary glands, for want of material. The worm, which is sluggish in its habits, is found in moist places by slowly moving water. I found the same worm, or a close ally, at Hastings last summer, but, as only one specimen was taken, and one's holiday equipment does not render identications easy, the exact species was not determined,

2. Fridericia agricola, Moore.

Mr. C. Whitehead, of Maidstone, has recently submitted specimens of this worm for examination, on account of their having been found associated with meadow-grass which showed symptoms of disease. First found by Mr. Moore in America, it was some time ago discovered by me in two localities in Cumberland. Its distribution is therefore wide, and it is important that, in connection with future records, an attempt be made to show whether or not it is worthy of suspicion as an injurious annelid. I have discussed the question in the 'Gardeners' Chronicle' for the present month.

3. Enchytræus pellucidus, n. s.

I give this name to a species taken by me among old stable-manure at Heaton Moor, Stockport, on March 4th, 1899.

It is a white, pellucid worm, with colourless blood, about three-quarters of an inch in length, and containing some sixty segments. There are usually four setæ in front of the girdle and three behind, equal in length, slender, and with a curve at right angles on the inner extremity, giving the setæ the appearance of a golf-stick. The curve, not as is usual, is very decided, the curved portion being nearly one-third the length of the shaft. The brain, which is about twice as long as broad, is oval, and rounded (not concave or notched) behind. There are no swellings or offgrowths on the nerve-ganglion, which is of practically equal size throughout. The salivary glands are unbranched and club-shaped, being swollen or knob-like at the free extremity. The spermathecæ open in the usual place between segments iv–v, *without glands, while the internal extremity is somewhat pear-shaped, and without diverticula or sac-like appendages. The girdle is minutely papillose, or presents a fine granular appearance. Very long coiled tube extending back to segment* xx, *or even as far as* xxiv. *The first nephridium seemed to lie in segment* vii. *Perhaps here the most distinctive feature is to be found in the spermathecæ, which differ from any I have seen elsewhere. These organs are divided into three parts, each of which is about equal in length to the other. These are* (1) *a slender tube connected with the gut,* (2) *the* *enlarged pear-shaped body,* (3) *the tube opening intersegmentally between* iv–v.

4. ENCHYTRÆUS ARGENTEUS has just reached me from Kew. It is new to Britain.

I have many other notes on species which are new or little known, and only require time for their fuller study.

NOTES AND QUERIES.

MAMMALIA.

CHIROPTERA.

Leisler's Bat in Cheshire.—When waiting for Bats in Dunham Park, near Bowdon, on May 8th, I noticed a large one with a flight that was different to that of the Noctule. I watched it until too late to get a safe shot, and missed. A few minutes later I saw a second Bat, which I succeeded in shooting, and was surprised to find that it was Leisler's Bat, *Vesperugo leisleri* (Kuhl). I killed it at 7.45 p.m., a short time after I had observed the first Noctules on the wing. The flight was slower and more erratic than that of the Noctule, whose movements early in the evening are usually dashing and rapid. On one or two evenings since I have noticed Bats with similar flight to the Leisler's Bat I shot, and believe that they were also of that species. It is not safe, however, to dogmatise on the difference, for on the 29th I saw a Bat flying slowly, which, when I shot it, turned out to be a female Noctule. Upon picking up the Leisler's Bat which I had shot, I was at once struck by the small size, the dark brown fur, and the absence of the peculiar smell of *V. noctula*; and, upon carefully measuring the animal and examining the teeth, I felt sure that it was *V. leisleri*. Dr. N. H. Alcock and Mr. W. de Winton have kindly confirmed my identification of the species. All the Bats I noticed with this slow erratic flight were flying in one direction along an avenue of beeches. When they had passed I never saw them return, although undoubted Noctules which flew down the same avenue came back again several times. Both the Leisler's Bats and Noctules appeared to come from the same clump of old beeches, though I have not been able to discover from which tree they actually emerged. Noctules are exceedingly plentiful in Dunham Park, passing the day in holes high up in the beeches, and in the evening repairing to one of the glades or open spaces, where they course backwards and forwards high overhead. As a rule, on emerging, they fly higher than the tops of the trees; the Leisler's Bat I shot was a little below the level of the tree-tops. This species has not been previously recorded from Cheshire.—T. A. Coward (Bowdon, Cheshire).

The Serotine (Vespertilio serotinus) near Hastings.—Upon showing the note with this heading (Zool. 1897, p. 141) to my friend the Rev. E.

N. Bloomfield some months ago he informed me that a number of these Bats have established themselves under the eaves of his residence (Guestling Rectory, near Hastings). Since then I have had two opportunities of satisfying myself that the species is rightly identified. I am happy to add that Mr. Bloomfield and his sisters take great interest in the little animals, and will not have them disturbed.—W. RUSKIN-BUTTERFIELD.

RODENTIA.

Albino of the Beaver.—With reference to the communication of Mr. Service in 'The Zoologist' (*ante*, p. 220) concerning a white Beaver (*Castor canadensis*), I should like to record a specimen of a skin exhibiting this abnormality which came under my own notice. In 1893 or 1894 a taxidermist and dealer in Manchester showed me a beautiful albinic skin of this animal. This taxidermist, who was a Canadian, had been a trapper, and himself obtained the animal the pelt of which he showed me.—K. HURLSTONE JONES (H.M.S. 'Repulse,' Channel Squadron).

AVES.

Blackbird and Ivy-seeds. — With regard to the note on a male Blackbird (*Turdus merula*) storing seeds at the nest (*ante*, p. 181), I do not think it is at all likely that a male Blackbird would try to feed his mate on the *seeds* of the ivy. The *berries* of the ivy are eaten by Blackbirds and Thrushes in considerable quantities at the end of winter and in early spring. But the seeds are not digested by the birds; they are voided whole, and may be seen at that season piled up in small heaps all about my shrubbery and elsewhere. May I suggest the possibility of the seeds seen by Mr. Lewis piled on the side of the nest having been deposited in this manner?—O. V. APLIN (Bloxham, Oxon).

Is the Whinchat a Mimic?—To this question, propounded by Mr. H. S. Davenport in 'The Zoologist' (*ante*, p. 208) as to whether *Pratincola rubetra* is a mimic, I unhesitatingly answer, Yes. On May 20th, 1897, I was attracted by two Whinchats singing very diverse songs in a thin wood on the Pentlands; one of them was perched on the very summit of a Scotch fir, and began its song with the alarm-cry of the Redshank twice repeated, whilst the other had no such note in its song. I have also noted the Whinchat imitating the Sand Martin, the Sandpiper, and the Yellowhammer; and I believe that the great variations noticeable in the songs of individual birds of this species are the direct result of imitation — ROBERT GODFREY (46, Cumberland Street, Edinburgh).

Blue-headed Wagtail in Cumberland. — After waiting upwards of seventeen years, I have at last detected *Motacilla flava* in Lakeland. On the 1st of May I found a single specimen of this Wagtail running over the sea-bank in front of our house, in company with a flock of Meadow Pipits, with which the rarer visitor was probably migrating. The Wild Birds Act prevented my shooting it for the Carlisle Museum, but I watched it closely with my glasses for two hours in pouring rain, and had the pleasure of pointing out its white eye-stripe and other distinguishing characters to a young but promising ornithologist. On the 10th of May I found a single Ray's Wagtail on the same ground, also with some Meadow Pipits. The common Yellow Wagtail was much wilder than the Blue-headed species. I have seen plenty of Blue-headed Wagtails on the Continent, of course, but I never met with *Motacilla flava* in Britain before.—H. A. Macpherson (Allonby Vicarage, Maryport, Cumberland).

Abnormal Occurrence of the Pied Wagtail (Motacilla lugubris) through the Winter in Aberdeenshire.—I was surprised to see one of the above (a male bird) flying in search of food about my houses on the 29th November, 1898. In fact, it appeared to be so strange to me to see one of these beautiful birds pouncing readily into byres among cattle, or into a stable among horses, in search of food, that I could scarcely realize its identity, the plumage being somewhat rough, there being a pretty sharp snowstorm at the time; but there was no want of vivacity, and the bird contrived to get a good meal before disappearing for the day. It made an appearance again on Dec. 1st, being then engaged searching for suitable sustenance in the mill-dam when the latter was emptied of water by being used for threshing fodder. With a return of fine weather it was not noticed near the houses, but with a recurrence of snow it appeared on the 19th and again on the 25th of December. During January and February it was a very common visitor to the turnip-fields, especially where the turnips were being lifted. There is no doubt that this bird remained here the whole winter. I have seen the bird in this county, but nearer the sea-coast, or at lower levels in mild weather, in January and February, but never so far inland, and withstanding the whole winter. — W. Wilson (Alford, Aberdeen, N.B.).

The Delinquencies of Starlings.—When first I came to live in Derbyshire—ten years ago—I placed boxes on my house to encourage Starlings (*Sturnus vulgaris*). After two or three years' experience I came to the conclusion that these birds were rather too plentiful, and year by year, in May and June, I wish that their numbers were greatly diminished. In the Peak district we often have late frosts and cold easterly winds during spring, and the plants in our gardens are late in flowering. But as soon as a bright blossom appears on our borders the Starlings mark it as suitable building material for their nests; and later, when young plants are bedded out, they are often very destructive. I have seen them pull up young broad-bean plants; I have known them take, in a few hours, three dozen seedling French marigolds which had just been bedded out. Apparently all this mischief is very useless, as numbers of flowers and plants are scattered on the verandah, or may be found in the gutters between the gables of my house. But this is not their worst fault. At this time of the year it is a great pleasure to see the Swifts racing through the air, and to hear their shrill cries as they chase one another. Several pairs of Swifts nest every year in my house; but before they arrive the Starlings have taken possession of their nesting-holes. This leads to a fierce war being waged between the two species. It is true that now and again a Swift succeeds in throwing one or two unfledged Starlings out of the nest, but more often a battle takes place between the adult birds, and the Swift is very roughly treated. Sometimes he manages to escape, and flies far away hotly pursued by the Starling. But often they both fall to the ground together, and the Swift is left in a state too feeble to rise, and becomes an easy prey to any prowling cat. Several times the Swift's piteous squealing has brought me to the window, and I have seen the Starling hammering him with its beak. Last year I ran out and picked up a Starling and Swift clinging to one another so tightly that at first I could not disentangle them. The Swift was very weak indeed. However, I kept him indoors through the night, and next morning he was able to fly. This year Swifts did not come to us till the 7th of May, and already there were fights on the 15th, 16th, and 17th. Starlings are delightful birds, their varied songs and mimicry are so amusing, and in the winter they are among the few species which come to enliven us; consequently I do not like to shoot them, especially as shooting is apt to frighten the birds in my aviary. And yet they are a terrible nuisance, injuring plants, harrying the Swifts, and filling up ventilators and gutters. I should like to know whether others have observed the same feud existing between Swifts and Starlings. I have known Starlings to oust Sand-Martins, and have read of their taking possession of the holes made by Woodpeckers; but I do not remember ever seeing any note on their interference with Swifts.—W. Storrs Fox (St. Anselm's, Bakewell).

[In 1836 the Rev. T. Salway recorded a discovery of the skeletons of Swifts and Starlings in the tower of the church at Oswestry, Shropshire. As many as fifty-seven were discovered together in a small chamber rather more in size than "half a square foot" (Mag. Nat. Hist. vol. ix. p. 350). Swifts are seemingly pugnacious birds. Bree, writing in 1832, says:—"Swifts, I am told (though I never witnessed the fact), will sometimes fight with each other, and in such cases the contending parties are occasionally brought to the ground, and have been found so circumstanced, and with the claws of each mutually clasped into those of the other."—Ed.]

Spoonbills near Great Yarmouth. — On May 10th I saw six Spoonbills (*Platalea leucorodia*) on Breydon. They were standing in line by the edge of a "drain" on one of the "flats." They were evidently "taking a nap," but on the near approach of my boat they all assumed a very picturesque attitude, as if listening and watching my progress. Each one's head was thrown at half a right angle, the neck craned into an S-shaped posture, one leg being drawn up out of the water,—whether the left or right I could not distinguish, as the evening was closing in. Presently they took to flight in a long line, and in single file, with bills out forward and legs nearly straight behind. They looked very much like Swans as they sailed silently away towards another "flat." They made no sound whatever, nor are they capable, I think, of doing so. I have seen several of these birds, and kept a tame one many months, but never heard them utter the slightest cry. The six Spoonbills kept about the neighbourhood several days. They are very sociable birds, and an odd one is sure to associate with Gulls, as do any small flocks that visit us; while they appear to trust greatly to the vigilance of the Gulls (mostly the "grey" or immature of the Greater Black-backed species, which are virtually resident on Breydon all spring and summer) for intimation of any intrusion. The Gulls noisily take to flight, the Spoonbills taking the hint after a preliminary look round, and making off to a distance on their own account.—A. PATTERSON (Great Yarmouth).

Black-breasted Partridges.—The Partridges with *black* horseshoes on their breasts, seen in a local game-dealer's shop by Mr. R. H. Ramsbotham (*ante*, p. 224), were doubtless examples of the Bearded Partridge (*Perdix daurica*), which has now been offered for sale (sometimes as the Manchurian Partridge) in the London markets for several years. The range of this bird is described in Mr. Ogilvie-Grant's 'Handbook to the Game Birds' (vol. i. p. 150), as "North-eastern and Central Asia, extending north to Dauria; east to Amoorland, Manchuria, and the mountains near Pekin; west to Dzungaria and the Tian-shan Mountains: and south to the sources of the Yangtze-kiang." Further particulars about this bird may be gathered from a correspondence in the 'Field' newspaper for March and April, 1898. The Russian Partridges sold in the shops after the close season have the horseshoe usually of a darker brown than it is in English birds, and the plumage of the upper parts is perhaps of a colder, greyer tint. But the unfortunate liberty to sell "Russian" Partridges in spring, at present enjoyed by game-dealers, undoubtedly would enable an unscrupulous person to sell English birds under that name long after the close season begins.—O. V. APLIN (Bloxham, Oxon).

[Quite recently in these pages (1898, p. 215), Mr. Dresser, under the heading "Rare Partridges in Leadenhall Market," also gave a full account of *Perdix daurica* and its range.—ED.]

Ornithological Notes from Aberdeen.—APPEARANCE OF MIGRANTS DURING 1899.—The Lapwings (*Vanellus vulgaris*) appeared here in flocks on Feb. 9th; the Curlew (*Numenius arquata*) on Feb. 26th, but only solitary birds. It was a week later before they were generally seen about this part, and they continued to arrive even considerably later. A green-billed Gull (*Larus canus*) appeared inland here on March 3rd: a pair of Pied Wagtails (*Motacila lugubris*) on March 8th. On March 23rd two Grey and Yellow Wagtails (*M. melanope*) reached us during the severest snowstorm of the season. A Ring Ouzel (*Turdus torquatus*) I observed on April 20th. A Dunlin Sandpiper (*Tringa alpina*) was noticed on April 30th. The Cuckoo (*Cuculus canorus*) was first heard on May 1st. A flock of Wild Geese crossed over on May 11th, and on the 12th a few House Swallows (*Hirundo rustica*) were flying about; and a few Sand Martins (*Cotile riparia*) on the 15th. About the last two dates some of the migratory small birds, as Warblers, were noticed. But at the date of writing (May 20th) neither Wheatears nor Whinchats, both fairly common here under ordinary circumstances, have been noticed by me. The unparalleled cold spring evidently kept them away at the dates when they usually appear.

SOME PECULIARITIES OF THE SEASON IN BIRD-LIFE.—With such very mild weather in mid-winter, and severe when we usually expect genial weather, it is only reasonable to suppose that something unusual could be observed in ornithological circles. I noticed pairing going on among Red Grouse (*Lagopus scoticus*), and energetic pairing among Partridges (*Perdix cinerea*). I found an egg of the latter in an occasionally utilized water-course on March 17th; it had been recently laid, and the upper part of the shell was quite complete, though brittle with the severe frost prevailing at the time, the part immersed having been much affected by the action of the water, leaving nothing but the skin to cover the contents. I have referred to the Lapwings in a previous communication; they, of course, appeared in flocks early, being beguiled by the warm weather to suffer severely by late snowstorms, and a stray bird or two appeared through the season. We heard the Sky-Lark (*Alauda arvensis*) singing on Feb. 9th, and remaining mute at the usual date at which it sings most. It was noticeable that the wary Curlew did not fall under the spell which misled the Lapwings. It was well into March before they had generally arrived, instead of appearing about the same time as the Lapwings do in normal seasons. Probably also the increase in numbers of the latter, owing to recent legislation, may induce them to extend their haunts with the mild weather. The Curlews are little affected by the Protection Acts, as they are adepts in their breeding grounds at keeping out of harm's way. The Robins (*Erithacus rubecula*) were the tamest on record here about March 22nd. Pied Wagtails have been about in their usual numbers, while the

Grey and Yellow species appeared earlier than usual, and during the height of the snowstorm. The Ring Ouzel seems to vary, over a series of seasons, in its date of appearance, being evidently guided by the nature of each year. These birds certainly came earlier during recent years than formerly; but they were certainly not welcomed, owing to their habit of plundering gardens, but they have probably increased since protection has been resorted to. Sandpipers seem to appear fairly near one date, *viz.* about the end of April. The Cuckoo was evidently early, especially when there was so little genial weather. Local circumstances govern their appearance in our immediate locality, where young wood, with abundance of insects, attracts them earlier than before. But it must be remembered that on moors here Cuckoos choose Mountain Linnets (*Linota flavirostris*) for foster-parents, and the offspring may be hardier and calculated to appear earlier, and remain longer than those brought up by less hardy birds. There were twos and threes flying together a few days after their first appearance, and apparently more notice was taken of them by the Twites than by other birds. It is an open question whether any recognition would occur either between the last season's young or adult Cuckoos, and those Linnets which had been foster-birds. The Wild Geese were evidently later than usual by one month to even six weeks, while the Swallows were pretty early considering the cold season.—W. Wilson (Alford, Aberdeen).

REPTILIA.

The Cape Monitor.—In Mr. C. Haagner's remarks upon *Varanus albigularis* (*ante*, p. 226), I think he must be confusing that reptile with *V. niloticus*, as I have killed several of each species in the north-east of the Transvaal, and never found *V. albigularis* near water, but always far away from it, and invariably taking refuge in clefts of adjacent rocks. Moreover, I have never met with one four feet in length. *V. niloticus* I have found existing in quite large colonies on sunny banks near rivers, into which they invariably plunge on being disturbed; and I have never seen them, when near water, take refuge in rocks. I have noticed them dive headlong from banks quite twenty feet above the level of the water. I have by me several skins of both species, some of *V. niloticus* measuring five feet in length; but those of *V. albigularis*, although when killed apparently covering bodies of full-grown specimens, none of more than three feet in length. I may say that I have carefully compared my skins with the Zoological Society's living specimens of these two species.—Chas. H. J. Tanner (2, Cardigan Mansions, Richmond, Surrey).

PISCES.

Notes from Great Yarmouth.—On Jan. 5th I saw a stunted Codling (*Gadus morrhua*). Length, 14 in.; of this the head measured 5 in. Depth of fish, 4½ in. An equally remarkable Herring (*Clupea harengus*) was sent me on Feb. 28th. It was 2 in. deep up to the dorsal and anal fins, but was nearly normal in shape, and then singularly shortened behind. Length, 6¾ in.; it should, if perfect for its size, have been 10 in. long. I had a Codling sent me on Jan. 20th, in which the mouth was strangely placed under the head, the snout protruding considerably, the lower lip being singularly like that of a Shark. The tongue formed a kind of ball or stopper which effectually closed the mouth when necessary. Length, 13½ in. On Jan. 16th I met with a Lemon Sole (*Solea lascaris*), which was brought to the fish-wharf. I saw a Brill (*Rhombus lævis*), on March 2nd, which was pure white on the upper surface, with the exception of the extreme margin of the fins; the latter half of the tail was coloured, as was a small ring encircling each eye normally. I was shown a large Turbot (*R. maximus*), on May 29th, which was also white all over the upper surface, save here and there a small spot of grey. Both fish, as in all cases of albino Turbots, were minus the spiny processes which dot the back or upper surface. A small example of the Greenland Bullhead (*Cottus scorpius* var. *grœnlandicus*) reached me on April 29th. On May 21st a local shrimper brought me a fish which was quite new to him. It measured 4 in. in length. On comparing it with Day's plate, I found it to be an example of *Blennius gattorugine*. It was not at all highly coloured, as depicted by Couch, but was of a dull tawny or yellow-brown, the edges of the fins being of a ruddy hue. Day speaks of it being subject to variation according to locality, and no doubt on our sandy coast such a stray fish would assume more sober tints than in its native rocky habitat. Mr. T. Southwell, to whom I sent it for confirmation of my finding, noticed it was not so deep as in Day's figure, and the "slight notch" mentioned between the spinous and soft portions of the dorsal fins did not seem to him to exist in my specimen. This is the first record of *B. gattorugine* occurring in East Anglian waters. The specimen has been spirited, and will be presented to Yarmouth Museum at the Old Tolhouse Hall.—A. Patterson (Great Yarmouth).

[The Gattorugine, known to fishermen of the West of England by the homely appellation of Tompot (Couch), has been recorded from the north-east coast. "Included in Sir Cuthbert Sharp's List of Hartlepool Fishes," *cf.* R. Howse, 'Cat. Fishes of the Rivers and Coast of Northumberland and Durham,' p. 25. It is reported as lying concealed in pools among long seaweeds, where it is probably often overlooked.—Ed.]

AVICULTURAL NOTES.

Aviculture and its Scientific Status.—Although for many years the increase in the number of zoological gardens has shown that scientists have desired to become familiar with the living representatives of their cabinet specimens, there has been, and still is, a tendency amongst the more conservative even of trustworthy cabinet naturalists to look with pity upon records of the lives of animals as observed in captivity. Every scientific man should bear in mind that the records of new facts in the life-history of an animal, whether observed in captivity or freedom, are a positive gain to science, and of more importance (when not easily discoverable) than the description of a skin, inasmuch as anyone with average ability can describe that upon which he can always lay his hand; but many difficulties may obtrude themselves when an observation has to be made from living subjects.

Aviculture, or the study of birds in captivity, ought to be as scientific as the study of dead birds, and when pursued in a proper spirit it undoubtedly is so. The true aviculturist always has his faculties awake; he must never overlook any detail in the nidification of a species, any change in its plumage, or the colouring of its soft parts; he must observe when and how the change takes place—whether by moult, gradual growth of colour in the feathers, or abrasion of the brittle fringes of overlapping feathers revealing the underlying colour; every courting posture and note must be carefully recorded, and the meaning of the notes studied. Although but little use has been made, by scientific workers, of the valuable facts got together in Dr. Russ's 'Handbuch für Vogelliebhaber,' there is not the least doubt that they are of considerable importance. A bird can never be said to have been perfectly described until the true colouring of the soft parts is included in the description. Very many species have been fully described by Russ, the colouring of the soft parts being carefully noted in nearly every instance; yet how seldom do we see any use made of these records by cabinet workers! Surely this is a mistake.

It has been asserted that birds cannot be properly studied, even in large aviaries, because they are under unnatural conditions. This is not only untrue, but in many instances it is practically impossible to study their habits under any other conditions. Probably the only reason why the nidification of many of the commonest small birds has never been noted by collectors is because they have only come across them on the edges of morasses, or the outskirts of dense jungle and thicket, into which the birds could penetrate with ease, but the observer could not follow. When impenetrable scrub is represented by half a dozen bushes, the conditions (if not the same as when the bird is wild) can hardly be called unnatural, and observation of the nesting habits becomes easy. The fact that unnatural birds (*i. e.* what are known as fanciers' birds), when turned out into a large aviary, frequently construct the typical nests of their remote ancestors, is an argument (I think) against the assumption that aviary life is unnatural, and therefore untrustworthy. The young plumages of many common foreign birds are still unknown to recognized ornithologists, and unrepresented in our museums. The aviculturist who describes these young plumages, or supplies the gaps in collections, is undoubtedly doing good ornithological work, and has as much claim to the title of scientist as any other man who adds to the sum of general knowledge.

For the reasons adduced above, I think it would be an excellent thing if the Editor of 'The Zoologist' would open a column in its pages for new scientific facts observed by aviculturists. I feel sure that, from time to time, Messrs. Meade Waldo, St. Quintin, the Rev. H. A. Macpherson, and other well-known reliable students of birds in captivity, would be able to add to the general store of ornithological knowledge.—A. G. BUTLER.

[We have great pleasure in opening a column for the communications of aviculturists. The aviary, like the aquarium, should afford some much desired zoological information, where observations may be made on the habits of animals which are practically unattainable elsewhere. Zoological gardens in all civilized countries sufficiently attest the scientific importance of the study of animals in captivity. Those who keep birds purely for pastime are equivalent to those who shoot them only for sport, and do not affect the argument.—ED.]

Longevity of Red-headed Cardinal.—It may interest some of your readers to know that I have just lost by death a Red-headed Cardinal (*Paroaria cucullata*), which I bought in February, 1874, and which had therefore lived for twenty-five years and four months in captivity, always in a cage.—WALTER CHAMBERLAIN (Bromesberrow Place, Ledbury).

NOTICES OF NEW BOOKS.

The Geography of Mammals. By William Lutley Sclater, M.A., F.Z.S., and Philip Lutley Sclater, M.A., Ph.D., F.R.S. Kegan Paul, Trench, Trübner & Co., Ltd.

Dr. P. L. Sclater has made the problem of the geographical distribution of animals peculiarly his own. By a circumstance which seldom occurs to most specialists, his son has inherited his tastes, and shares his studies on the subject. Most zoologists will have read, or at all events be cognizant of, the latter's papers on the Geography of Mammals published in 'The Geographical Journal' (1894–97), while Dr. Sclater's communication "On the Distribution of Marine Mammalia" appeared in these pages (1897, pp. 217–28). These together are now republished, with many illustrations and some additional matter.

This branch of zoological science in its present conception is inseparable with this country and the present century. Dr. Prichard, in his memorable 'Researches into the Physical History of Mankind,' was one of the first to give a reasonable working hypothesis. This was followed by Swainson in his 'Geography and Classification.' In 1857 Dr. Sclater proposed his divisions as applied to Birds before the Linnean Society, which was further elaborated and upheld at the Bristol Meeting of the British Association in 1875. Wallace in the main adopted these views, and they are now generally accepted, subject, of course, to some criticism in detail incidental to all widely accepted generalizations.

The main divisions or regions are mostly maintained in the sense originally proposed, though some qualification is to be found in the sub-regions. This is to be particularly noticed in the Ethiopian region, in which the Cape sub-region now includes "the whole country as far north as Angola on the west, and up to the Tana river on the east," and may probably in time be made to include Somaliland as well. Many zoologists have advocated the union of the Palæarctic and Nearctic regions from the similarity, or rather the many similarities, to be found in their faunas, but the Sclaters argue that these affinities are only of recent origin, and that "palæontological evidence seems to show that, out of all the four regions embraced under the term 'Arctogœa,'* the North American or Nearctic Region was the first to be separated from the main mass, and that the similarity is a comparatively modern element in the character of the two faunas."

It is unnecessary to refer to the most original contribution to this volume, in the chapter on the Distribution of Marine Mammals, for, as before mentioned, this article has already appeared in these pages. Now that the Terrestrial and Marine Mammals have been treated on the Sclaterian method, we may hope that the other orders may be studied and published in the same manner. Of the fifty illustrations contained in the text, no fewer than forty have been designed by T. Smit for this work; there are also eight coloured maps; and the volume may be well accepted, so far as Mammals are concerned, and for a long time to come, as the last authoritative statement on the subject.

Outlines of Vertebrate Palæontology for Students of Zoology. By ARTHUR SMITH WOODWARD. Cambridge: at the University Press.

THE study of Prehistoric Man was once completely relegated to the domain of Archæology: it is now no longer neglected by the historian. It is one of the greatest benefits arising from the evolutionary method in the proper study of Zoology, that both Embryology and Palæontology are now considered of primary importance if we wish to understand the problem of present animal existence. Science to-day is more interested in the past than in the future of animal life, and when we really know the first we may perhaps be able in some sense to predicate the second. It is the hither that will guide us to the whither. As we read these pages, commencing with the speculative Palæozoic Conodonts, and arrive at the Pliocene *Pithecanthropus erectus*, we feel that we are contemplating an era of which as yet so little is known, and of which so much more must yet be told. The chances against finding organic remains are innumerable; "every item of knowledge acquired may indeed be literally described as owing to a chapter of accidents"; to the palæontologist the knowledge of the past must often seem to be as carefully guarded as the portals of the future. And yet, with all the "imperfection of the geological record," palæontological interpreters—among whom will always be mentioned Owen and Marsh—have given a knowledge which may without offence be designated as a revelation.

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* Europe, Asia, Africa, Asiatic islands down to Wallace's line, and North America down to the Isthmus of Tehuantepec.

With the fascination incidental to the study of a past era and an unseen fauna, caution is a first and last word, in fact, the alpha and omega of palæontological speculation. Mr. Woodward is careful to explain that, "owing to the imperfection of the geological record and the incomplete exploration of most formations, any statement now formulated may eventually prove to be quite a partial account of the facts, and every conclusion must be more or less provisional and tentative"; while "the known facts of geology are still too few to restore the life-provinces of the globe at the various stages of its past history." This is a good book for the zoological library; it may be, as the author modestly suggests, "an elementary handbook," but at the same time it conveys an indispensable information which by many zoologists is necessarily possessed in a more than elementary manner.

New Zealand Moths and Butterflies (Macro-Lepidoptera). By G. V. Hudson, F.E.S. London: West, Newman & Co.

The Butterflies and larger Moths of New Zealand have now procured a satisfactory treatment, and by the aid of this fully illustrated work it is possible to form a conception of the interesting but modest lepidopteral fauna of "Te Ika a Maui." In 1855 the missionary Richard Taylor, in his account of the islands, gave us a few coloured figures of the butterflies and moths found there; Butler subsequently figured the Rhopalocera, whilst Meyrick has described and enumerated very many of the Heterocera, so that the time was ripe for a fully illustrated monograph. Mr. Hudson is a conscientious follower of Meyrick's views in classification, and this is the first time we have seen that proposed arrangement followed of the butterflies being included between the Notodontina and the Psychina—in other words, immersed in the moths.

In the introduction Mr. Hudson discusses most of the modern theories connected with the Lepidoptera, though of "warning colours" he can only suggest one example of a moth in New Zealand, while he states that not a single instance of "mimicry" can yet be adduced in the Lepidoptera of the islands. In connection with the butterfly *Anosia crippus*—formerly generally known as *Danais archippus*, and which in quite recent times has spread over a large surface of the earth—it is interesting to note that it was observed in New Zealand as early as 1840. The cosmopolitan *Pyrameis cardui*, our "painted lady," is found in New Zealand, and so is *Protoparce convolvuli*, the Convolvulus Hawk-Moth, known so well at home and seen so generally abroad.

The plates are chromo-lithographed by West, Newman & Co. and in colour leave nothing to be desired. We have seen even more artistic work from this firm when they have had the insects themselves to portray ; but in this case coloured drawings were sent home to be reproduced, which have been most faithfully copied. We trust that the author may fulfil his half-implied promise of publishing a similar work on the Micro-Lepidoptera of New Zealand.

EDITORIAL GLEANINGS.

The death is announced, at Melbourne, of Prof. Sir F. McCoy, who had for the last five-and-forty years made his home in Australia. Prof. McCoy was an able geologist and palæontologist; he was Professor of Natural Science in the University of Melbourne, and to him was due the formation of the Melbourne National Museum, which he directed. The well-known publication, 'Prodromus of the Zoology of Victoria, or Figures and Descriptions of the living Species of all Classes of the Victorian Indigenous Animals,' he commenced in 1878. Twenty decades were published up to 1890, when the work ceased.

Prof. Ludwig Büchner died on April 30th last. Büchner's name was once somewhat freely anathematized as that of the author of 'Kraft und Stoff' and 'Natur und Geist,' but he will be best remembered by zoologists in connection with a volume which appeared in an English translation in 1880 under the title of 'Mind in Animals.' He also translated into German Lyell's 'Antiquity of Man,' and published 'Die Darwinsche Theorie.'

The death has been announced, at Hull, of Mr. Henry Bendelack Hewetson, surgeon, of Leeds. In the science of natural history he was quite an enthusiast. In 1885 he was elected President of the Leeds Naturalists' Club and Scientific Association, and during that year he obtained from the Corporation the grant of a room in the Municipal Buildings for the housing of the collections and library and holding of meetings of that body. At the close of the year the rules were altered to permit of the re-election of a President for a second year, and he was accordingly made President for the following year. In 1896 he was again elected President, a position which he once more filled in 1897. As President he constantly advocated the foundation of a Scientific Institute by the joint action of the several scientific societies of Leeds, and in 1896 a decided step was taken in this direction, but unfortunately without success. As an ornithologist, Mr. Hewetson recorded several new visitors to our shores, and, in conjunction with other observers, did much good work, especially in regard to the study of migration. He also assisted in the exploration of the famous "kitchen middens" in the Holderness district of East Yorkshire. On his visits to the North Coast of Africa he made valuable collections of the birds and insects of that region. In this department of his recreations his artistic abilities were of great service, for he could depict natural history objects in colours with wonderful fidelity. His incursions into the realm of photography were limited to the use of a hand camera, with which he was fairly successful. 'Thoughts on Ornithology' and 'Nature Cared for and Uncared for' were subjects upon which he wrote with knowledge. He was a Fellow of the Royal Geographical Society, a Fellow of the Linnean Society, a Fellow of the Zoological Society, and a member of the British Ornithological Union.

THE greatest of animal painters has passed away. Mlle. Rosa Bonheur died at Fontainebleau on May 26th. Although the deceased artist did not rank as a zoologist, still the painter of the "Horse Fair" studied and knew her subjects, and in art reflected nature beyond the capacity, as a rule, of those who paint or those who observe.

AT the meeting of the Royal Microscopical Society on May 7th, the Fellows, assisted by many friends of the Quekett Microscopical Club, gave an exhibition of Pond-life. The exhibition was highly successful, the many beautiful objects exciting much admiration. Among them may be mentioned *Lophopus crystallinus; Daphnia pulex* (this entomostracan was stained with a solution of fuchsin, which a depraved taste had induced it to imbibe, apparently without harm, but which caused its internal economy to be very conspicuous); *Hydatina senta* was exhibited; and specimens of *Melicerta ringens*, a tube-dwelling rotifer which is its own brickmaker and bricklayer. *Hydra viridis* was on view, showing ovary and testes, the ovary in the amœboid stage. From Dundee came *Bursaria t.*, *Conochilus*, *Mastigocerca bicarinata*, *Notommata collaris* of Ehrenberg, *Stephanoceros*, &c. There were also exhibited *Rivularia* and *Draparnaldia*, a highly attractive exhibition of hundreds of brilliantly illuminated rotifers of various species, careering in all directions on a dark background, and *S. serrulatus*, an entomostracan hitherto unrecorded in Britain; the water-mite (*Hydryphantes dispar*), another mite (*Limnesia hystrionica*), and *Notops brachionus*, which is one of the most beautiful of the free-swimming rotifers.

AT the meeting of the Linnean Society of April 20th the Rev. O. Pickard-Cambridge communicated a new list of British and Irish spiders. After reviewing the existing literature on the subject, and the materials which had come to hand since 1881 for a new and revised list of species, the author pointed out that the present paper was not intended merely for the use of authors or collectors interested in local faunas, but to give (with references to primary authorities) the spiders at present known to belong to Great Britain and Ireland, leaving the question of their distribution, abundance, or scarcity to be dealt with at some future time, when the present scanty number of spider-collectors might have increased. At present large areas of varied natural characters, in some cases whole counties, and many maritime districts, were entirely unexplored, so far as their arachnology was concerned. With respect to nomenclature and systematic arrangement, the author had mainly followed the plan of 'The Spiders of Dorset' (1881); but in dealing with the large groups represented by Mr. Blackwell's *Neriene*, *Linyphia*, and *Walckenæra*, he had to a great extent followed M. Simon's lead in breaking up these genera in order to bring a large heterogeneous mass of material into a fairly workable form.

The Report of the Council and Auditors of the Zoological Society for 1898 is now before us. A continual increase in the number of members is again shown, which has now been going on for the past six years, and the number of Fellows is now in excess of what it has been in any year since 1885. A new Llama-house has been constructed. The reconstruction in an improved form of the Llama-house, one of the oldest buildings in the Gardens, has long been a matter of urgency. It is believed that the new house, which has been built upon the same site from plans drawn up by Mr. C. B. Trollope, is well adapted for the purpose for which it is intended. It is a well-lighted and airy building, and gives excellent accommodation to the Society's stock of these animals. The new Llama-house was built by Messrs. Smith & Co., at a cost of £767 7s. 2d., which has been charged to the extraordinary expenditure of the year 1898. More space being required for the proper accommodation of the Society's fine series of Zebras and Wild Asses, it was determined by the Council, in 1898, to erect a new Zebra-house immediately adjoining the existing Zebra-house, in the further corner of the Middle Garden, upon the site then occupied by the old Ostrich-house, which had become available on the transfer of the Ostriches and Cassowaries into the new Ostrich-house in the South Garden. The new Zebra-house, which was designed by Mr. Charles B. Trollope, and built by Messrs. Smith & Co., will, it is believed, be found to give excellent accommodation to these favourite animals, and at the same time replace an old and ruinous building by an elegant and ornamental structure. The total number of deaths of animals in the gardens during the year 1898 was 1054, showing a decrease of 142 as compared with the previous year. Of these deaths the more important were:—The young Giraffe which was purchased on July 6th. This animal only lived for one month in the Gardens; the principal post-mortem appearance was the œdematous condition of many of the internal viscera. Three Chimpanzees and three Orangs have died during the year, and no fewer than twenty-six Kangaroos of various species. Of the latter some five or six appear to have suffered from a contagious fever. Two Ostriches, a Tiger, two Three-toed Sloths, and four Leopards were the principal remaining losses of importance.

The following is a list of the more noticeable additions made to the Menagerie during the year 1898:—

A fine young female Mountain Zebra (*Equus zebra*), bred in the garden of the Zoological Society of Amsterdam; a young male Leucoryx Antelope from Senegal; a young male Reindeer (*Rangifer tarandus*), from Newfoundland; two examples of Forster's Lung-fish (*Ceratodus forsteri*), from Queensland, purchased of Mr. D. O'Connor, who has successfully conveyed from Australia to England four fine living specimens of this remarkable Dipnoan Fish, believed to be the first ever brought to Europe alive; a young pair of White-tailed Gnus (*Connochætes gnu*), presented by Mr. C. D. Rudd, F.Z.S., who kindly brought them from his park at Fernwood, Newlands, near Cape Town, in order to make a change of blood in the small herd of these Gnus in the Society's Gardens; a young male Lesser Koodoo (*Strepsiceros imberbis*), from Somaliland, being the third example of this rare Antelope received by the Society; an example of an apparently new African Monkey of the genus *Cercopithecus* (proposed to be called *C. lhoesti*), received from Congoland by the Zoological Society of Antwerp, and obtained in exchange from that Society; a gigantic Centipede (*Scolopendra gigas*), from Trinidad; a series of fifty-two large Tortoises from the Galapagos Islands, deposited by the Hon. Walter Rothschild on July 20th. Nineteen of these, from Duncan Island, appear to be referable to *Testudo ephippium*, and thirty-four, from Albemarle Island, to *Testudo vicina;* a very fine and large specimen of the Reticulated Python (*Python reticulatus*), which exceeds in size the specimen which lived for twenty years in the Society's Gardens; twelve African Walking-fish (*Periophthalmus koelreuteri*); an adult male example of the Duke of Bedford's Deer (*Cervus xanthopygius*), from Northern China; and a young male Siamang (*Hylobates syndactylus*) from the native state of Negri Sembilan, Malay Peninsula, being the first individual of this extremely interesting Anthropoid Ape that has reached the Society in a living state.

THE Year Book of the United States Department of Agriculture for 1898 has just reached our hands. As usual, this volume is not one alone for the agriculturist or horticulturist. In a large sense it is distinctly zoological. The communication by Mr. T. L. Palmer on "The Danger of introducing Noxious Animals and Birds" is well worth the most careful perusal. Some facts relating to accidental or involuntary migration may be repeated. "In November, 1895, a Central American Mouse of the genus *Oryzomys*, concealed in a bunch of bananas shipped from Puerto Limon, Costa Rica, was captured alive in a commission house in Washington, D. C. A young murine Opossum from Tropical America was discovered in a bunch of bananas at Ames, Iowa, during the summer of 1882, and was kept alive for some time. If such cases were frequent, it can be readily seen how a species might gain a foothold in new regions, provided the conditions were favourable for its increase." Members of the Sparrow cult will not find agreeable reading in the account of "the true character of the bird" as detailed in these pages. The expenditure for its destruction in Illinois (1891–95) and Michigan (1887–95) amounted to about 117,500 dols. The introduction of the Sky-Lark (*Alauda arvensis*) and the Blackbird (*Turdus merula*) into New Zealand, where the first has become the scourge of the turnip field, eating the seeds soon after planting, and the second is well known as a champion fruit destroyer, induces the remark that both these birds "are noted singers; but the charms of their song hardly compensate for damage to crops."

MR. J. W. WILLIS BUND has republished a paper read at the Victoria Institute, Worcester, on "The Life of a Severn Salmon." Much has still to be learned respecting this fish, as we read that no one can give a really satisfactory statement as to the length of time a Salmon will live if it escapes death by the hands of its numerous enemies, nor can tell with accuracy the time it takes to produce a twenty-pound Salmon. We cannot say we know even the outlines of the life-history of a Salmon in fresh water. "A question of some interest arises as to the age to which a Salmon will live. Here again more evidence is wanted; a twenty-pound fish cannot be less than four years old, and is probably older. He would be hatched out, say, in 1890, would descend as a Smolt in 1891 at the earliest, and perhaps not till 1892. If he went down in 1891, he would probably return as a Grilse in 1892, as a Gilling in 1893, as a Salmon in 1894; but he might not go down till 1892, and his return in any of the stages might be prolonged, so that it will be safe to say that a twenty-pound fish is probably seven years old, and very possibly older. One fact seems clear, that the male Salmon grows larger, and so presumably lives longer than the female; it is the exception to get a female Salmon over thirty pounds, while it is common to get males over that weight. Why this is, I cannot explain; I only state the fact. Against this must be set the assertion that at spawning-time the mortality of males is said to be greater than the mortality of females."

In the 'Annals of Scottish Natural History' for April, Mr. J. A. Harvie-Brown has published "Notes on some Scottish *Salmonidæ*." In the well-known angling county of Sutherland, with its innumerable lochs and streams, there are many interesting varieties of *Salmonidæ*. All of these, however, rank, as the writer believes with Dr. Day, only as varieties of the principal species or types recognized in that author's 'History of British Fishes,' and still more recently accentuated in his 'British and Irish *Salmonidæ*.' These species are:—The Salmon, *Salmo salar*, L. ('British and Irish *Salmonidæ*,' p. 51); the Sea-Trout, *Salmo trutta*, L. (*op. cit.* p. 149); the Fresh-water Trout, *Salmo fario*, L. (*op. cit.* p. 182); the Char, *Salmo alpinus*, L. (*op. cit.* p. 112); and all other so-called species must, Mr. Harvie-Brown considers, have their names sunk to the value of mere varieties—such as the Great Lake Trout (*Salmo ferox*), and many others, not speaking, of course, of aberrant forms of the *Salmonidæ*, such as the Sperling (*Osmerus eperlanus*). The notes refer mainly to certain varieties of the *Salmonidæ* belonging to the above species which are found in different lakes and rivers in Scotland, such as the Loch Maidaidh and Smoo Burn-Trout; Crasspuil Trout; Loch Sean Trout; the Tidal Trout of the rivers Inver and Kirkaig, known to the natives as "Fossacks"; Parr-marked Trout of Loch na Sgeirach; and Hump-backed Trout of Fheoir Lochan.

A writer in the 'Westminster Gazette' has called attention to the decrease of Salmon in the Welsh Dee:—"This river is peculiarly fitted by nature for the abode of Salmon. Deep, swirling pools alternate with rapid runs and long sluggish reaches. It possesses a noble estuary, and numerous tributary streams, admirably adapted for breeding purposes, flow into it. From various causes the supply of Salmon has declined of late years, and at the present time the Fishery Board finds its operations seriously hampered. Its income is derived entirely from the licences taken out by rod and net fishers, and so marked is the scarcity of Salmon this year that there has been a great falling-off in the number of net licences, with a corresponding decline in the revenue. It is, of course, possible that an improvement may take place ere the close of the season, but present conditions do not favour the supposition, and there is reason to fear that, in common with many other rivers, the Dee is steadily deteriorating as regards the stock of Salmon. It is evident that as the income of the conservators falls off so does their ability to preserve the river. In the absence of funds they cannot pay watchers to guard it, and nowhere in the kingdom is poaching more rife during the close season than in North Wales. The state of affairs is serious, for when once a certain limit of scarcity is reached on Salmon rivers, matters are likely to go from bad to worse unless prompt and energetic action be taken. On various English rivers scarcity has led by gradual degrees to the extinction of the *Salmonidæ;* the Thames is a notable instance in point, and there are streams on the east coast of England, where Salmon once were numerous, in which nowadays the king of fresh-water fishes is never seen. I am far from suggesting that such misfortune is in store for the Welsh Dee, but the river is in an unsatisfactory condition, and has been for some years. Among the causes which are contributing to its decline the presence of Pike in large numbers, both in the main river and its tributaries, is not the least injurious; these predatory fish destroy enormous quantities of Salmon fry, and are equally harmful to the Trout-fishing. During the spawning season gangs of men raid the tributary streams by night, and it is manifestly impossible for one or two watchers to cope with these lawless intruders. Apart from these causes it is difficult to account for the deterioration of the Dee. It is not seriously polluted. The Fishery Board has been at considerable pains to improve it by putting up fish passes and a Salmon hatchery, and one can only conjecture that over-netting in past years is responsible for the present scarcity. The conservators would perhaps be well-advised to raise the charge for net licences; by seeking the co-operation of the riparian owners they might still make adequate provision for watching the river."

IN the 'Transactions' of the South African Philosophical Society (vol. x. part 2) appears a very welcome "Bibliography of Books, Pamphlets, Maps, Magazine Articles, &c., relating to South Africa, with special reference to Geography. From the time of Vasco da Gama to the formation of the British South Africa Company in 1888." The compilation is by Mr. H. C. Schunke Hollway, and comprises 2099 separate entries. Although zoological publications have not been made a specialty in the compilation, the zoologist who wishes to read the observations of early travellers will find this bibliography a guide to much neglected and little-known literature on the subject. The zoologist will, however, find in the same publication vol. x. part 3) a "Résumé of recent scientific publications bearing on South Africa from January 1st, 1897, to June 30th, 1898," which we hope will be continued.

THE Tres Marias Islands are situated off the west coast of Mexico, about sixty-five miles west from the port of San Blas. Their natural history had been very moderately detailed. Grayson, a naturalist, made three trips to the islands in 1865, 1866, and 1867, and, in conjunction with Laurence and Bryant, published several papers thereon. Forrer collected there for the British Museum in 1881, but no detailed account of his work has been published. In the spring of 1897 E. W. Nelson and E. A. Goldman made an expedition to the Tres Marias, and the results are embodied in No. 14 of the Memoirs devoted to the North American Fauna published by the U. S. Department of Agriculture at Washington. Mammals, Birds, Reptiles, Crustacea, and Plants are described by Nelson, Steineger, Rathburn, and Rose. The number of species of animals and plants now known for the Tres Marias are 11 Land Mammals, 83 Birds, 18 Reptiles, 2 Fresh-water Fish, 1 Fresh-water Shrimp, and 6 Land Molluscs. The plants enumerated are 136. The surprising result is in the number of species peculiar to these islands, which are clearly continental islands from the absence of a deep separating channel. Thus in species and subspecies, 7 Mammals, 23 Birds, and 1 Reptile appear to be peculiar to the islands. Mr. Nelson also adds a bibliography of the Tres Marias Islands.

AMERICA is still the head-quarters for Economic Entomology. We have just received a lengthy and well-illustrated memoir published by the University of Kansas, and forming the sixty-fifth contribution from the Entomological Laboratory. It is entitled "Alfalfa, Grasshoppers, Bees; their relationships," by S. J. Hunter. *Melanoplus differentialis* is the destructive locust which is particularly referred to, and its anatomy is well illustrated. "In alfalfa culture, if the Grasshopper proves an incentive to proper cultivation, the insect is a blessing in disguise. Disking alfalfa fields in the early spring, after the frost has left the ground, and before vegetation has well started, increases the yield of the first crop one-third; matures the second crop earlier, and brings from it an equally increased yield; destroys the native Grasshopper eggs placed therein, and kills the native grasses which frequently threaten to reclaim the field."

THE Royal Mail steamer 'Stola,' according to the 'Aberdeen Journal,' has just had the not unique experience of running down a Whale. The steamer was on her passage on Wednesday, April 26th, between Stromness and Scapa, in the Orkney Isles, when a violent shock was felt abreast of Swanbister. Immediately afterwards a large Whale rose under her quarter with a fearful gash in its body, and throwing up blood and water from its blowhole to a height of fifteen feet. The 'Stola' was steaming twelve knots, and must have nearly cut the Whale in two. As the captain had the mails on board he could not stop, but as long as the Whale was visible it was seen to be lashing the water furiously.

THE 'Daily Chronicle's' Liverpool Correspondent says:—"A gem of French colonial protectionist policy reaches me from Loango. The authorities of the French Congo, being rather short of money, have issued a decree placing a tax of fifty centimes on every Parrot exported from that colony to Europe."

We are glad to notice the growing recognition of "Zoology" as an applied science. In the 'Pharmaceutical Journal' a course of "Zoological Notes for Pharmacists" is now in course of publication.

On Thursday afternoon, Oct. 6th, 1898, Mr. J. Passmore Edwards laid the first stone of the Essex Local and Educational Museum of Natural History. The Museum, designed by Messrs. Gibson and Russell, will ultimately be a very handsome structure, adjoining, but distinct from, the Technical Institute of the West Ham Corporation in the (Main) Romford Road, Stratford. The cost of the building and ground will be about £6000, towards which Mr. Passmore Edwards munificently contributes £2500, on condition that the Museum shall contain the Essex Field Club's County Collections of Natural History. The balance of the cost, and the up-keep of the building, will be defrayed by the Corporation of West Ham, acting through their Technical Instruction Committee. In accordance with the scheme of the Agreement made between the Corporation of West Ham and the Essex Field Club, dated 25th July, 1898, the Museum will be carried on as a Permanent Institution under that Agreement as follows:—

(*a*) The Corporation agree to dedicate the main portion of the building to the purposes of a Museum of Local (Essex) Natural History, Prehistoric Archæology and Anthropology, and of educational series relating to the same; to warm, light, and provide for the caretaking of the building; that the Club shall have the sole scientific control of the collections, and the appointment of the Curator, and be allowed to keep its Library in the building; the Corporation also agreeing to make a grant of not less than £100 per annum towards the curatorial expenses.

(*b*) The Club agree to place their county collections, cases, and cabinets in the Museum (excepting the Epping Forest collections, which are to be retained in the Forest Museum at Chingford); to do their best to increase and improve the same; to undertake the selection and scientific control of the collections; to raise a certain capital sum for the further equipment of the Museum; to appoint a Curator, and to devote a sum of £50 per annum towards the curatorial expenses.

As at least £1000 will be required for the wall-cases, table-cases, cabinets, and other equipments necessary to a Natural History Museum, donations are invited, which may be paid to Lloyds' Bank (Essex Field Club Account—Town Side), 72, Lombard Street, E.C.; or to the Treasurer, W. C. Waller, Esq., Loughton, Essex.

BRITISH 12 JY 99 MUSEUM